Nitrogen dioxide (NO₂) is one of a group of gases known as nitrogen oxides (NOₓ). NO₂ has direct health effects but can also react with other pollutants in air to form ground-level ozone (O₃) and particulate matter (PM), the major components of smog. NO₂ also contributes to the formation of acid rain.

**What is Nitrogen Dioxide?**

**Health Effects of Nitrogen Dioxide**

Health effects of outdoor NO₂ can occur even at very low concentrations, including:

- Increased lung problems
- Increased hospital admissions
- Increased medical visits
- Premature death

NO₂ contributes to the formation of acid rain.

**Who is Most at Risk from Air Pollution?**

Even healthy young adults can experience health issues on days when the air is heavily polluted but some groups are more at risk:

- Children
- Seniors
- People with asthma, chronic obstructive pulmonary disease (COPD), cardiovascular diseases, diabetes
- Active people of all ages who exercise or work hard outdoors

**How Can I Protect Myself from Air Pollution?**

Know the best times to be active outdoors:

- Check the Air Quality Health Index in your community (airhealth.ca)
- If you have a heart or lung condition, talk to your health care professional about additional ways to protect your health when air pollution levels are higher

Ways to reduce exposure:

- Avoid or reduce strenuous outdoor activities when air pollution levels are higher
- Avoid or reduce exercising near heavy traffic, especially during rush hour

**What Action is the Government of Canada Taking on Nitrogen Dioxide?**

- Federal regulations have reduced outdoor NO₂ emissions in Canada from key sources.
- Canada has agreed to international treaties to reduce NO₂ emissions from outdoor sources.
- Canada has established the Canadian Ambient Air Quality Standards (CAAQS). These are health- and environment-based numerical values of outdoor air concentrations of pollutants intended to drive continuous air quality improvement in Canada. The CAAQS, a key element of the Air Quality Management System, were developed through a process steered by the Canadian Council of Ministers of the Environment (CCME).

**Where do Nitrogen Oxides Come From?**

NO₂ comes mainly from combustion, with the majority originating from man-made sources. Main sources of outdoor NO₂ are (but not limited to):

- Vehicle emissions
- Transportation of goods
- Trains
- Airplanes
- Ships
- Construction
- Oil and gas industry
- Electricity generation
- Transportation of goods

**Levels of Nitrogen Dioxide in Outdoor Air**

Levels of NO₂ in outdoor air are higher in cities, especially near areas of heavy traffic, and are lower in smaller communities and in rural areas. Levels of NO₂ are also higher near some industries. More information can be found on the State of the Air website:

http://airquality-qualitedelair.ccme.ca/en

**Table: CAAQS Numerical Values**

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>Effective in 2020</th>
<th>Effective in 2025</th>
<th>Units</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO₂</td>
<td>1 hour</td>
<td>60</td>
<td>42</td>
<td>Parts per billion (ppb)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual (1 year)</td>
<td>17.0</td>
<td>12.0</td>
<td>The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations</td>
<td></td>
</tr>
</tbody>
</table>

For more information on air pollution, please visit [www.canada.ca/en/health-canada/services/air-quality.html](http://www.canada.ca/en/health-canada/services/air-quality.html) or contact us at: HC.air.SC@canada.ca

© Her Majesty the Queen in Right of Canada, as represented by the Minister of Health, 2018 Cat.: H129-RG2018-E-PDF | ISBN: 978-0-660-27084-5 | Pub: 180155